

Species Diversity, 2001, 6, 363–376

## New Taxa of Osminiini (Insecta: Lepidoptera: Sesiidae) from China, with Establishment of a New Subgenus from the Western Palaearctic

Oleg G. Gorbunov<sup>1</sup> and Yutaka Arita<sup>2</sup>

<sup>1</sup> A. N. Severtsov Institute for Problems of Ecology and Evolution,  
Russian Academy of Sciences, Leninsky Prospekt 33,  
Moscow V-71, 117071 Russia  
E-mail: ogorbu@orc.ru

<sup>2</sup> Zoological Laboratory, Faculty of Agriculture, Meijo University,  
Tempaku-ku, Nagoya, 468-8502 Japan  
E-mail: arita@ccmfs.meijo-u.ac.jp

(Received 12 October 2000; Accepted 15 October 2001)

A new genus, *Sazonia* gen. nov. (type species: *Sazonia gorodinskii* sp. nov.), including two new subgenera, *Sazonia* subgen. nov. and *Miniosa* subgen. nov. (type species: *Sesia fenusaeformis* Herrich-Schäffer, 1852), and a new species, *Sazonia* (*Sazonia*) *gorodinskii* sp. nov. are described and figured from extra-tropical Asia. Probable trends of the origin of all these taxa are discussed.

**Key Words:** Lepidoptera, Sesiidae, Osminiini, new genus, new subgenus, new species, China, Anatolia, taxonomy.

### Introduction

In 1984, Z. Laštůvka included *Sesia fenusaeformis* Herrich-Schäffer, 1852 (erroneously cited as *S. fenusaeformis* Lederer, 1853), an Anatolian species, in the genus *Osminia* Le Cerf, 1917, which had been established for a species from Mexico. At the time of this nomenclature act, the genus *Osminia* included only two species and the tribe Osminiini was represented by two genera occurring in the southern areas of North America (Duckworth and Eichlin 1977; Laštůvka 1984). *Osminia* spp. and *S. fenusaeformis* share a series of similarities, both superficially and in the general conformation of the male and female genitalia; however, more in-depth study of the morphology of the species has shown that these similarities are not really so close. In addition, the inclusion of a species endemic to Asia Minor in the Central American genus *Osminia* appears completely ungrounded from a zoogeographical viewpoint; it contradicts all notions concerning the faunogenesis of the Palaearctic fauna as well as that of both Americas.

According to our current knowledge of the history of the fauna of clearwing moths of the Palaearctic Region, there could have been only two pathways of dispersal of the ancestors of the species in Asia Minor. They could have followed a route either from Southeast Asia on the so-called Himalayan migratory pathway along the northern coast of the former Tethys Sea, or from Africa via the Arabian Peninsula and the Near East. Most likely that the roots of the taxon should be

searched in Southeast Asia.

As the result of a research for several years on the fauna of Sesiidae of the Oriental and Afrotropical regions, we have managed to clarify that the tribe Osminiini is one of the most numerous among the Sesiidae of these areas (Arita and Gorbunov 1995, 1998, 2000a, 2000b; Gorbunov and Arita 1995a, 1995b, 1998). For the present, this tribe is represented in the Afrotropical and Oriental regions by at least 10 genera and not less than 60 species. By comparison, only three genera and 13 species are currently known in the Western Hemisphere (Eichlin 1998). The low number of Western Hemisphere taxa appears to corroborate our opinion concerning the origin and the present distribution of the family around the world.

Unfortunately, in the course of our study of the clearwing moths of the Old World, we could not find any taxon that could serve as proof of our suppositions concerning the relationships of *Sesia fenusaeformis*. This was the reason for our retaining *S. fenusaeformis* in *Osminia* in a recently published review of the Palaearctic Sesiidae (Špatenka *et al.* 1999). However, in 1998 in high mountains of southern China (Yunnan Province), a very interesting species of Osminiini was collected, the ancestors of which probably had a common root with those of *S. fenusaeformis*. We describe it as *Sazonia gorodinskii* gen. et sp. nov. herein.

By comparing the morphological features of *Sazonia gorodinskii* with those of *Sesia fenusaeformis*, and also with those of species of the genus *Osminia*, it is possible to infer the following relationships of these taxa. First, *Sazonia gorodinskii* is undoubtedly in closer relation to *Sesia fenusaeformis* than to the American species of the genus *Osminia*. Second, a series of morphological differences, especially in the conformation of the female genitalia, allow us to separate *Sazonia gorodinskii* and *Sesia fenusaeformis* at the subgenus level. Thus we erect *Miniosa* subgen. nov. for *S. fenusaeformis*. Further, our knowledge of historical zoogeography and faunogenesis tells us without a doubt that the common ancestor of the recent taxa *Sazonia* and *Osminia* was restricted more or less to the region comprising present-day Southeast Asia. From the late Tertiary, in the Pliocene or even in the late Miocene, a descendant (or descendants) of this common ancestor could have moved out of Asia eastward across Beringia to North America. The descendants of this branch comprise the recent Osminiini of the New World. Despite repeated restoration of the Bering Land Bridge during the glacial stages of the Pleistocene, the links between the heat-loving clearwing moths of Asia and those of the Western Hemisphere were irrevocably interrupted, at the latest, by the late Pliocene. On the other hand, the links between the descendants of the Asian branch (such as the subgenera *Sazonia* and *Miniosa*) were prolonged, even during Pleistocene, along the so-called Himalaya migratory pathway.

All the above considerations allow us to make some conclusions concerning the systematic position of these taxa. These conclusions form the core of the present publication.

Unfortunately, in our recent publication (Špatenka *et al.* 1999: 88), the synonymy and bibliography for *Sazonia (Miniosa) fenusaeformis* (Herrich-Schäffer, 1852), comb. nov. (cited as *Osminia fenusaeformis* (Herrich-Schäffer, 1852)) were not wholly accurate and complete. We correct this mistake herein.

All specimens examined or cited herein are in the following collections abbreviated in the text as follows: COGM—collection of Oleg G. Gorbunov, Moscow, Russia (belonging to the Institute for Problems of Ecology and Evolution, Russian

Academy of Sciences); CAGM-collection of Andrei A. Gorodinski, Moscow, Russia; CSSM-collection of Sergei K. Sazonov, Moscow, Russia; ZMHB-Museum für Naturkunde der Humboldt Universität, Berlin, Germany.

### Taxonomic Account

#### *Sazonia* gen. nov.

Type species: *Sazonia (Sazonia) gorodinskii* sp. nov.

**Description.** Small or medium-sized, superficially *Dipchasphecia*- or *Scopulosphecia*-like clearwing moth with alar expanse 11–20 mm.

Head with antennae strongly clavate, without cilia in both sexes; frons smooth-scaled, with small, shelf-like tuft of flat scales laterally at base of each antenna; labial palpus long, somewhat exceeding upper margin of frons, with hair-like or setaceous scales or smooth-scaled ventrally; proboscis long, well developed, functional; vertex with long, hair-like, protruding scales; occipital fringe consisting of hair-like scales.

Thorax smooth-scaled with hair-like scales dorsally; posteriorly both metepimeron and metameron with long, hair-like scales.

Legs smooth-scaled; coxae and femora with hair-like scales at posterior margin; mid and hind tibiae with tuft of hair-like and setaceous scales both medio-dorsally and dorso-distally.

Abdomen smooth-scaled; anal tuft well developed.

Forewing with transparent areas well developed or posterior transparent area undeveloped in both sexes; veins  $R_1$  and  $R_2$  parallel; veins  $R_3$  and  $R_{4+5}$  separated basally or arising from a point; veins  $R_4$  and  $R_5$  stalked for about 1/3 of length (Figs 4, 5).

Hindwing transparent; discal spot extremely narrow, nearly undeveloped or cuneiform, extending to base of common stem of  $M_3$ - $CuA_1$ ; vein  $M_2$  arising at middle of cross-vein; veins  $M_3$  and  $CuA_1$  short-stalked; distance between base of vein  $CuA_2$  and cross-vein about 2–4 times that between cross-vein and base of vein  $M_3$ ; vein  $CuP$  slightly sclerotized in basal 1/5–2/3; vein 1A well developed, issuing from basal part of vein 2A; veins 2A and 3A thin, short, fused distally, not reaching margin of wing (Figs 4, 5).

Male genitalia (Figs 6, 7) with tegumen-uncus complex narrow; uncus with oval plate of fine, dense, short, hair-like setae; gnathos beak-shaped; valva elongate, relatively narrow, turned-up distally, densely covered with long, hair-like setae at ventral margin, with low crista medially; saccus broad and short, slightly shorter than vinculum; aedeagus somewhat longer than length of valva; vesica with row of minute, pin-shaped cornuti.

Female genitalia (Figs 8, 9) with papillae anales relatively long and broad, covered with short setae; sternite 8 relatively broad, sometimes distinctly narrowed and fused antero-dorsally; posterior apophysis somewhat longer than anterior apophysis, latter sometimes with long, narrow appendix ventro-basally; both lamellae antevaginalis and postvaginalis undeveloped; ostium bursae at middle of intersegmental membrane between segments 7 and 8, broad, unspecialised (Fig. 9) or well sclerotized and somewhat protruding (Fig. 8); antrum well sclerotized,

long, broad; ductus bursae membranous, about as long as antrum (Fig. 8) or very short (Fig. 9); corpus bursae ovoid, membranous, with large, pocket-shaped signum.

**Differential diagnosis.** Due to its appearance, wing venation, and conformation of both the male and female genitalia, *Sazonia* gen. nov. resembles the New World genus *Osminia* (type species: *Osminia ferruginea* Le Cerf, 1917), but it can be distinguished by the structure of the aedeagus (apically with various sclerotizations, often with dorsal and/or lateral processes in *Osminia*) and antrum (distinctly shorter, membranous or slightly sclerotized in the genus compared) of the male and female genitalia, respectively. In the venation of both fore- and hindwing, this new genus is somewhat similar to Afrotropical genera *Aenigmina* Le Cerf, 1912 (type species: *Aenigmina aenea* Le Cerf, 1912) and *Microsynanthedon* Viette, 1955 (type species: *Microsynanthedon ambrensis* Viette, 1955) and the Oriental genus *Chamanthedon* Le Cerf, 1916 (type species: *Chamanthedon hypochroma* Le Cerf, 1916), but *Sazonia* clearly differs by the well developed proboscis (proboscis reduced and non-functional in all these genera compared) and the structure of both the male and female genitalia (cf. Gorbunov and Arita 1998, figs 16a–d, 17a–d; Arita and Gorbunov 1998, figs 10a–e, 11a–d, 12a–d, 2000b, figs 7–9). *Sazonia* is separable from the Afrotropical genus *Homogyna* Le Cerf, 1911 (type species: *Homogyna alluaudi* Le Cerf, 1911) by the venation of the hindwing (vein CuA<sub>1</sub> arising basally of the cross-vein in *Homogyna*) and by the structure of both the male and female genitalia (cf. Gorbunov and Arita 1998, figs 18a–e, 20). This new genus is distinguished from other genera of Osminiini by the wing venation, conformation of the legs, and structure of both the male and female genitalia (cf. descriptions and figures in our recent papers).

**Biology.** The larval biology is unknown. Moths fly in April–July in a single generation.

**Composition.** We divide this new genus into two subgenera, *Sazonia* subgen. nov. and *Miniosa* subgen. nov., and include a single species in each of these subgenera, namely *Sazonia (Sazonia) gorodinskii* sp. nov. and *Sazonia (Miniosa) fenusaeformis* (Herrich-Schäffer, 1852), comb. nov., respectively.

**Distribution.** Transition zone between Oriental and Palaearctic regions: Yunnan Province, China (subgenus *Sazonia* nov.) and southern part of the central Palaearctic: Crete (?), Turkey, Syria, Iraq (subgenus *Miniosa* nov.).

**Etymology.** The name of this genus is dedicated to Sergei K. Sazonov, an amateur lepidopterist (Moscow, Russia), who collected part of the type series and many other interesting species of the clearwing moths. Gender is feminine.

### *Sazonia* subgen. nov.

Type species: *Sazonia (Sazonia) gorodinskii* sp. nov.

**Description.** Medium-sized, superficially *Dipchasphecia*-like clearwing moth with alar expanse about 20 mm. Forewing with transparent areas well developed in both sexes; veins R<sub>3</sub> and R<sub>4+5</sub> separated basally (Fig. 4). Hindwing transparent; discal spot narrow cuneiform, extending to base of common stem of M<sub>3</sub>-CuA<sub>1</sub>; distance between base of vein CuA<sub>2</sub> and cross-vein about four times that between cross-vein

and base of vein  $M_3$ ; vein CuP slightly sclerotized in basal 1/5 (Fig. 4).

Male genitalia (Fig. 6a–d) with tegumen longer than uncus; valva elongate, relatively narrow, turned-up distally, with long, low crista medially.

Female genitalia (Fig. 8) with sternite 8 broad; anterior apophysis with long, narrow appendix ventro-basally; ostium bursae well sclerotized, somewhat protruding; antrum well sclerotized, long, broad, distinctly narrowing anteriorly; ductus bursae about as long as antrum; corpus bursae with triangular, pocket-shaped signum.

**Differential diagnosis.** See “Diagnosis” for *Miniosa* subgen. nov. below.

**Biology.** The larval biology is unknown. Moths fly in July in a single generation.

**Composition.** At present this new subgenus consists of only a single species: *Sazonia (Sazonia) gorodinskii* sp. nov.

**Distribution.** Transition zone between Oriental and Palaearctic regions: Yunnan Province, China.

***Sazonia (Sazonia) gorodinskii* sp. nov.**

(Figs 1, 2, 4, 6a–d, 8)

**Description.** *Male* (holotype) (Fig. 1). Alar expanse 18.6 mm; body length 12.5 mm; forewing length 8.5 mm; antenna length 5.3 mm.

Head: antenna dark brown to black with dark purple-blue sheen, with admixture of individual yellow scales dorsally in apical half; scapus dorsally dark brown to black with admixture of white scales ventrally; frons dark grey-brown with bronze sheen, with pair of narrow but ventrally broadened, lateral, white stripes; labial palpus dark grey-brown with bronze sheen, with admixture of white scales dorsally on basal two joints; vertex black with green-bronze sheen, with admixture of few golden-yellow scales; occipital fringe dorsally golden-yellow, laterally pale yellow.

Thorax: patagia dark brown to black with bronze-green sheen, with admixture of individual yellow scales anteriorly; tegula and mesothorax dark brown to black with bronze-green sheen, densely covered with white, hair-like scales; metathorax dark brown to black with bronze-green sheen, with tuft of white hairs on each side; thorax laterally dark grey-brown with bronze-green sheen, with few pale yellow scales medially; posteriorly metepimeron and metameron dark grey-brown with bronze-green sheen, densely covered with long, hair-like, white scales.

Legs: neck plate dark grey-brown with green-bronze sheen, with admixture of individual white scales; fore coxa dark grey-brown with green-bronze sheen, with narrow, cream-coloured stripe externally; fore femur dark grey-brown with bronze sheen, with white, hair-like scales at posterior margin; fore tibia dorsally dark grey-brown with bronze sheen, ventrally yellow-orange; fore tarsus dorsally dark grey-brown with bronze-green sheen, ventrally pale yellow with admixture of dark grey-brown scales distally on each tarsomere; mid coxa dark grey-brown with bronze-green sheen, covered with white, hair-like scales; mid femur dark grey-brown with bronze sheen, with white, hair-like scales at posterior margin; mid tibia dark grey-brown with bronze-purple sheen, with admixture of white, hair-like to setaceous scales exterior-medially; spurs cream to pale yellow with golden

sheen, with admixture of dark grey-brown scales dorsally; mid tarsus dorsally dark grey-brown with bronze-green sheen, ventrally pale yellow with admixture of dark grey-brown scales distally on each tarsomere; hind coxa dark grey-brown with bronze-green sheen, covered with white, hair-like scales; hind femur dark grey-brown with bronze sheen, with white, hair-like scales at posterior margin; hind tibia externally dark grey-brown with bronze-purple sheen, with admixture of white, hair-like scales medio-dorsally and with few white scales between bases of both pairs of spurs, internally white to pale cream with admixture of grey-brown scales distally; spurs cream to pale yellow with golden sheen, with admixture of dark grey-brown scales dorsally; hind tarsus dorsally dark grey-brown with bronze-green sheen, ventrally pale yellow with admixture of dark grey-brown scales distally on each tarsomere.

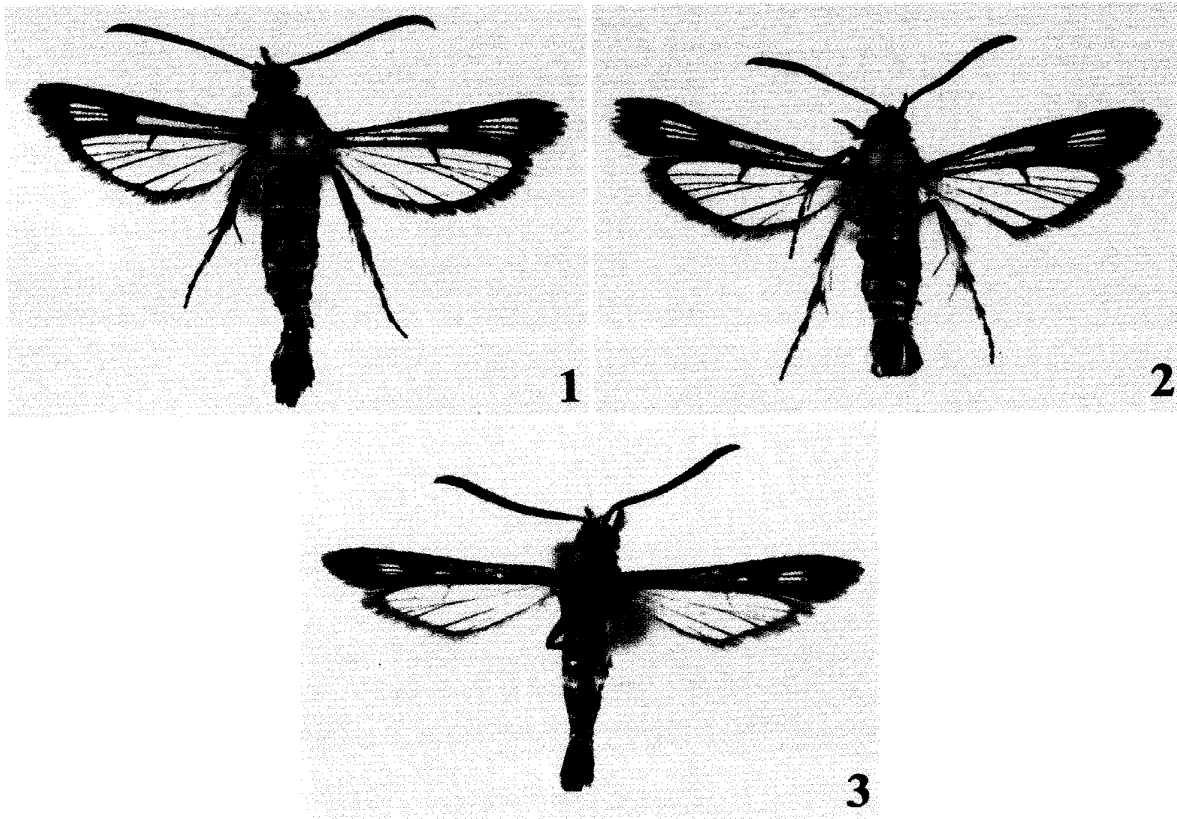
Abdomen: dorsally dark brown to black with green-bronze sheen; tergites 2 and 4-6 each with narrow, yellow stripe posteriorly; tergites 3 and 7 each with admixture of yellow scales posteriorly, ventrally dark grey-brown with green-bronze sheen; sternites 4 and 5 each with narrow, white stripe posteriorly; sternite 3 with few white scales posteriorly; anal tuft dark brown to black with green-bronze sheen, with narrow, white margins.

Forewing: basally black with strong bronze sheen, with few yellow scales; costal margin dark grey-brown with green-bronze sheen, with admixture of individual yellow scales; CuA-stem, anal margin, discal spot, and veins within external transparent area dark grey-brown with bronze sheen; apical area dark grey-brown with bronze sheen, with admixture of individual pale yellow scales between veins proximally; discal spot broad, slightly broadened costally; transparent areas rather well developed; external transparent area divided into 5 cells (cells between veins  $R_3$ - $R_{4+5}$  and  $M_3$ -CuA<sub>1</sub> very small and covered with white scales), level to vein  $M_2$  about 1.5 times as broad as discal spot and slightly broader than apical area; cilia grey-brown with bronze sheen.

Hindwing: transparent; veins and outer margin dark grey-brown with dark bronze sheen; discal spot narrow, cuneiform, extending to base of common stem of  $M_3$ -CuA<sub>1</sub>; outer margin narrow, about twice as narrow as cilia; cilia grey-brown with bronze sheen anally at inner margin.

Male genitalia (genital preparation No. GA-193) (Fig. 6a-d): tegumen-uncus complex relatively short and broad; uncus well separated from tegumen, mace-shaped, entirely and densely covered with short, hair-like setae; tegumen longer than uncus; gnathos well developed, beak-shaped; valva slightly turned up in distal third, somewhat narrowed and rounded distally, ventral margin narrowly covered with long, hair-like setae, with low fold medially; saccus short, rounded basally, somewhat shorter than vinculum; aedeagus slightly longer than length of valva, gradually thinner distally; vesica with elongate brush of thick, pointed cornuti.

*Female* (paratype) (Fig. 2). Alar expanse 19.2mm; body length 10.0mm; forewing length 8.0mm; antenna length 5.0mm. Somewhat more robust than male. Antenna without yellow scales dorsally in apical half. Thorax with tegula dark brown to black with bronze-green sheen, with small, yellow spot at base of forewing. Abdominal tergites 2 and 4-6 each with narrow, yellow stripe posteriorly; sternites 4-6 each with narrow, pale yellow stripe posteriorly; sternite 3 with few pale yellow scales posteriorly; anal tuft dark brown to black with green-bronze sheen, with 2, narrow, white stripes medially. Forewing with external transparent



Figs 1–3. *Sazonia* spp. 1–2, *Sazonia (Sazonia) gorodinskii* gen. et sp. nov.: 1, holotype, ♂, alar expanse 18.6 mm (COGM); 2, paratype, ♀, alar expanse 19.2 mm (COGM). 3. *Sazonia (Miniosa) fenusaeformis* (Herrich-Schäffer, 1852), comb. nov., ♂, alar expanse 13.5 mm (COGM).

area divided into 4 cells (cell between veins  $M_3$ – $CuA_1$  very small and covered with white scales), level to vein  $M_2$  about 1.5 times as broad as discal spot and slightly broader than apical area; cilia grey-brow with bronze sheen. Colour patterns otherwise as in male.

Female genitalia (genital preparation No. GA-240) (Fig. 8): papillae anales relatively long and broad, covered with short setae; sternite 8 broad, covered with relatively short setae; posterior apophysis about 1.3 times longer than anterior apophysis; latter with long, narrow appendix ventro-basally; both lamellae antevaginalis and postvaginalis undeveloped; ostium bursae at middle of intersegmental membrane between segments 7 and 8, broad, well sclerotized, protruding, densely covered with minute spines; antrum well sclerotized, long, broad, distinctly narrowing anteriorly; ductus bursae narrow, membranous, about as long as antrum; corpus bursae ovoid, membranous, with large, triangular, pocket-shaped signum.

**Individual variability.** This new species varies slightly in the number of yellow scales on the thorax and abdomen and white scales on the head and legs. Besides that, both males and females are somewhat variable in individual size: alar expanse 17.5–19.3 mm; body length 10.0–13.5 mm; forewing length 7.5–9.2 mm; antenna length 5.0–5.4 mm.

**Differential diagnosis.** This new species differs from *Sazonia (Miniosa) fenusaeformis*, comb. nov. by the coloration of the patagia (without yellow scales

anteriorly in the latter species) and the dorsal side of the abdomen (tergites 2, 4, and 6 each with narrow, pale yellow to white stripe posteriorly in *S. (M.) fenusaeformis*), and by the subgeneric characters. *Sazonia (Sazonia) gorodinskii* sp. nov. can be distinguished from all other Palaearctic and Oriental Sesiidae by the features given in the generic diagnosis.

**Bionomics.** The larval biology is unknown. The type series was collected by net in the middle of July at an altitude of about 2,000 m a.s.l.

**Habitat.** Slopes of gullies in a pine forest.

**Distribution.** Known only from the type locality in southern China (Yunnan Province).

**Material examined.** Holotype: ♂ (Fig. 1), S. China, Yunnan Prov., 12 km S. of Baoshan, 2000 m, 15.VII.1998, S. Sazonov leg. (genital preparation No. GA-193) (COGM). Paratypes: 1 ♀, same locality and date, S. Sazonov leg. (genital preparation No. GA-240) (COGM); 1 ♀ (Fig. 2), same locality, 2000 m, 10.VII.1998, A. Gorodinski leg. (COGM); 1 ♀, same locality and date, A. Gorodinski leg. (COGM); 1 ♂, 1 ♀, same locality, 2000 m, 14.VII.2000, A. Gorodinski leg. (COGM); 1 ♂, same locality and date, A. Gorodinski leg. (CAGM); 1 ♀, same locality and date, A. Gorodinski leg. (CSSM).

**Etymology.** The name of this new species is dedicated to Andrei A. Gorodinski, an amateur lepidopterist (Moscow, Russia), who collected part of the type series.

### *Miniosa* subgen. nov.

*Osminia* auctorum, nec *Osminia* Le Cerf, 1917 (type species: *Osminia ferruginea* Le Cerf, 1917)

Type species: *Sesia fenusaeformis* Herrich-Schäffer, 1852.

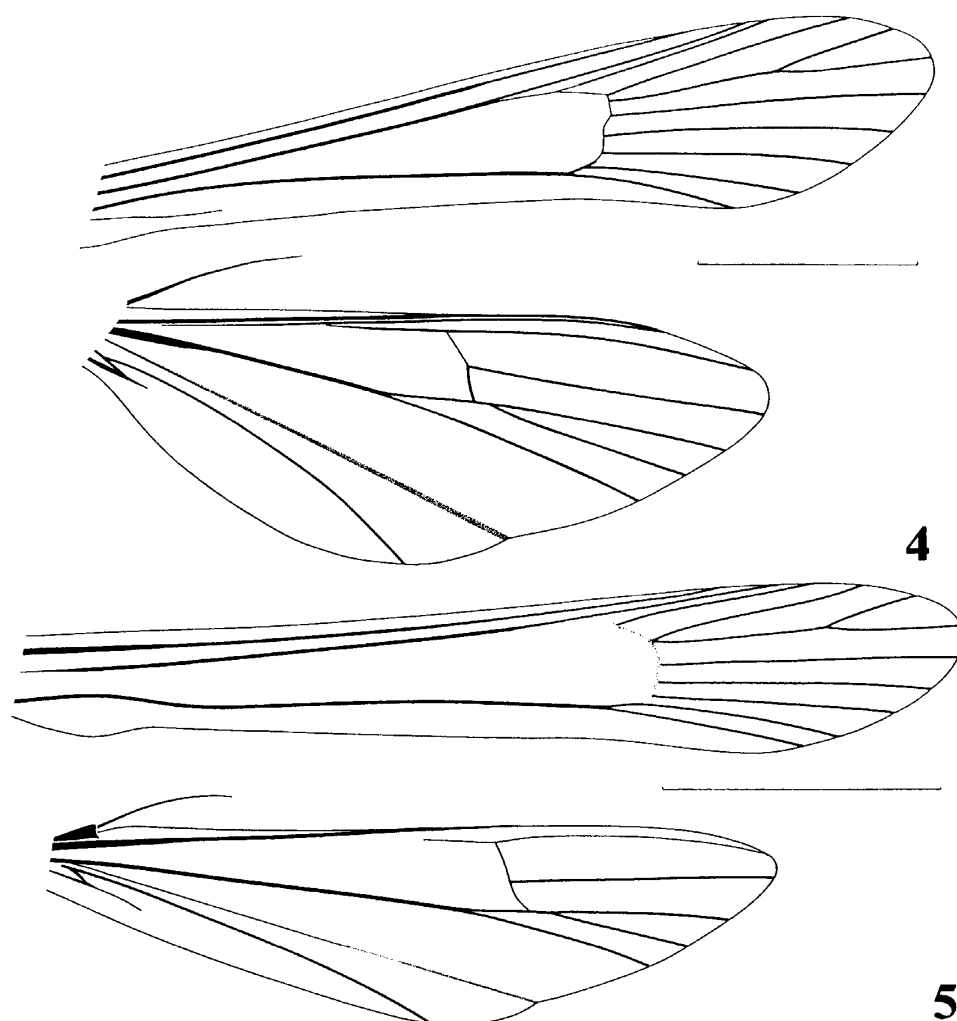
**Description.** Small-sized, superficially *Scopulosphecia*-like clearwing moth with alar expanse 11–15 mm. Labial palpus with hair-like and setaceous scales ventrally. Forewing with transparent areas small, posterior transparent area undeveloped in both sexes; veins  $R_3$  and  $R_{4+5}$  arising from same point; distance between bases of veins  $R_{3+4+5}$  and vein  $M_1$  slightly longer than that between bases of veins  $M_1$  and  $M_2$  (Fig. 5). Hindwing with discal spot extremely narrow or nearly undeveloped; vein  $M_2$  arising somewhat more anally than middle of cross-vein; distance between base of vein  $CuA_2$  and cross-vein about twice as long as that between cross-vein and base of vein  $M_3$ ; vein  $CuP$  slightly sclerotized in basal 2/3 (Fig. 5).

Male genitalia (Fig. 7a–d) with tegumen slightly shorter than uncus; valva with deep nock-like cut ventro-distally, and with long crista with short hairs medially.

Female genitalia (Fig. 9) with sternite 8 relatively broad, distinctly narrowed, and fused to single segment dorso-anteriorly; anterior apophysis without long, narrow appendix ventro-basally; ostium bursae broad, membranous, unspecialised; antrum well sclerotized, long, broad, gradually narrowing anteriorly; ductus bursae short, about 1/5 as long as antrum; corpus bursae with large, elongate, pocket-shaped signum.

**Differential diagnosis.** *Miniosa* subgen. nov. is distinguishable from the nominotypical subgenus by the presence of hair-like or setaceous scales ventrally





Figs 4–5. Wing venation of *Sazonia* spp. 4, *Sazonia* (*Sazonia*) *gorodinskii* gen. et sp. nov.; 5, *Sazonia* (*Miniosa*) *fenusaeformis* (Herrich-Schäffer, 1852), comb. nov. Scale bars: 2.0 mm.

on the labial palpus (entirely smooth-scaled in the nominotypical subgenus), and by the undeveloped posterior transparent area of the forewing and extremely small or even undeveloped discal spot of the hindwing. Besides that, these two taxa can be separated by the details of the wing venation (cf. Figs 4 and 5) and the conformation of the genitalia (cf. Figs 6, 7, 8, 9). *Miniosa* differs from *Osminia* by the presence of hair-like scales ventrally on the labial palpus (smooth-scaled or with slightly elongate scales in *Osminia*), by the structure of the aedeagus (apically with various sclerotizations, often with dorsal and/or lateral processes in *Osminia*), and by the conformation of the female genitalia (anterior apophysis with long, narrow appendix ventro-basally; antrum short, membranous, or slightly sclerotized; and ductus bursae distinctly longer than antrum in *Osminia*).

**Biology.** The larval biology is unknown. Moths fly in April–June in a single generation.

**Composition.** At present, we include in this subgenus only *Sazonia* (*Miniosa*) *fenusaeformis* (Herrich-Schäffer, 1852), comb. nov.

**Distribution.** Southern part of the central Palaearctic: Crete (?), Turkey,

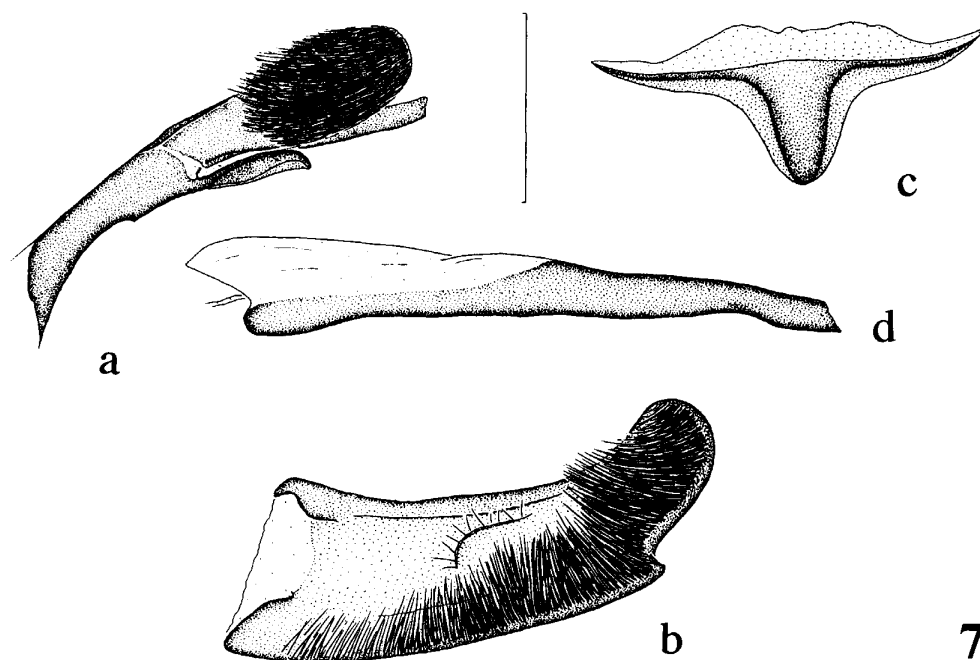
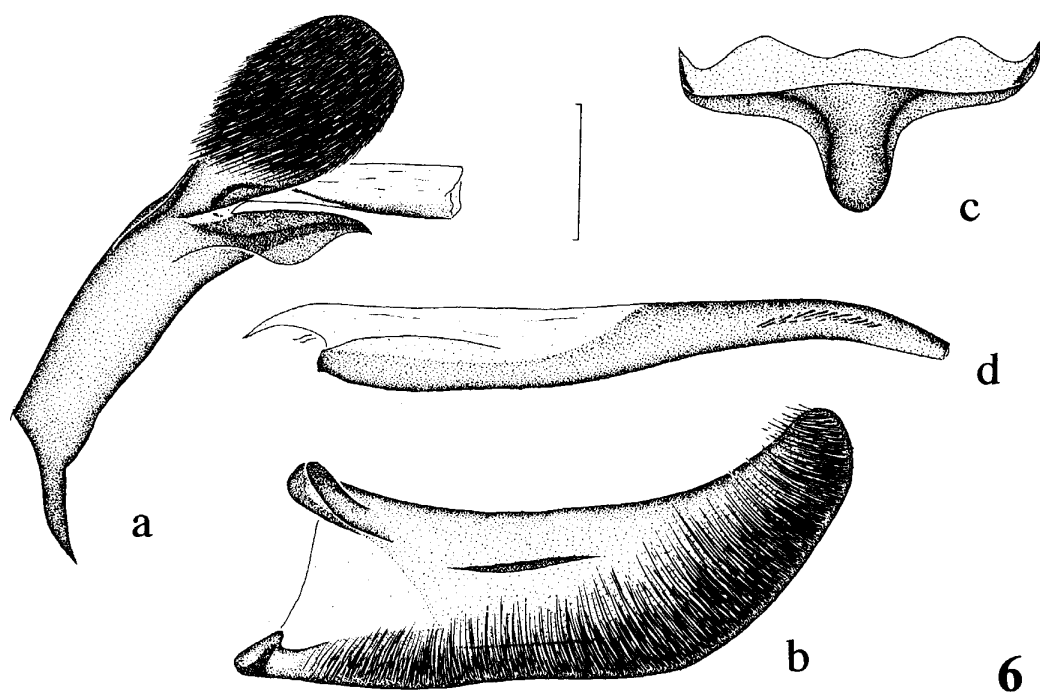
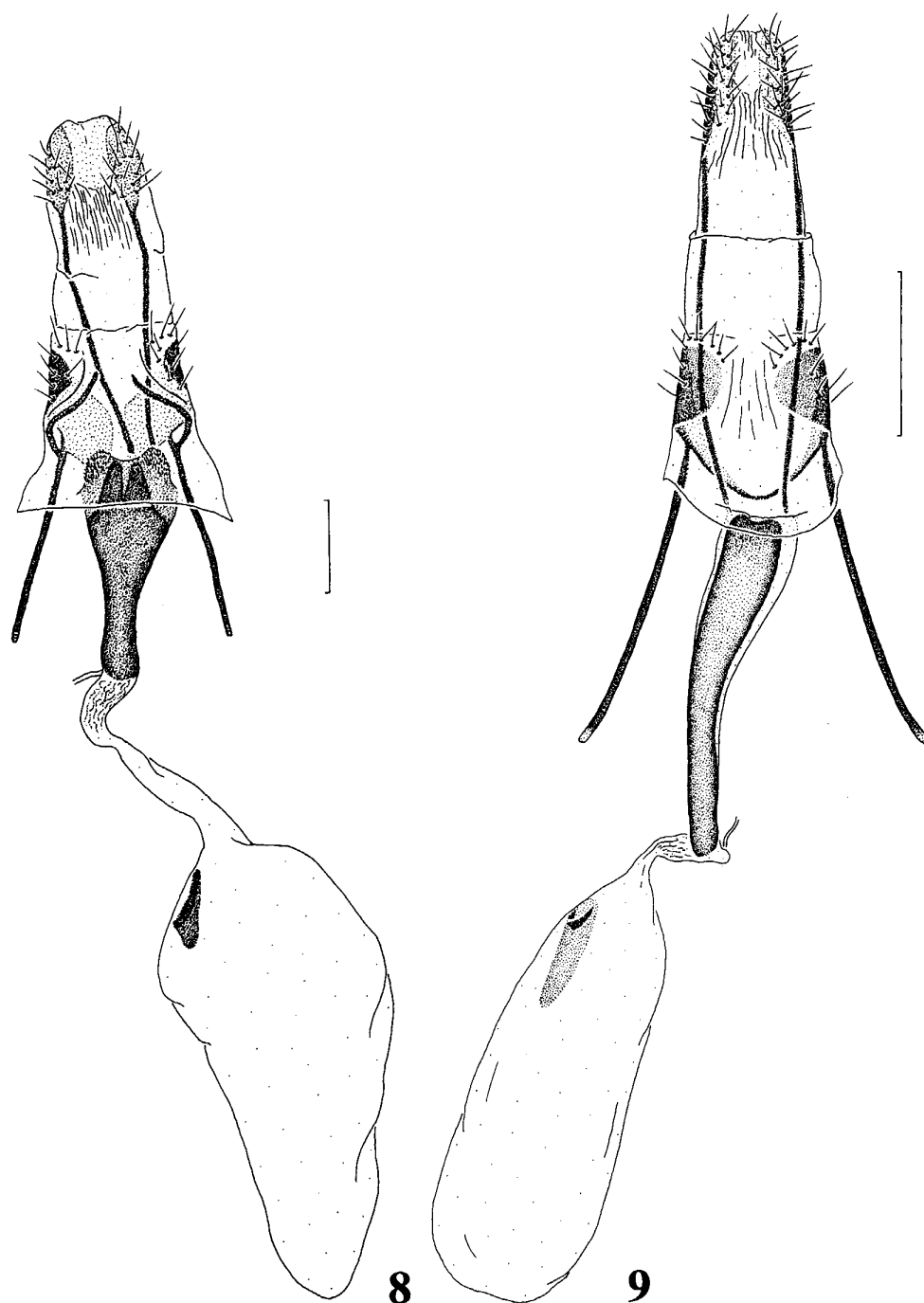


Fig. 6. Male genitalia of *Sazonia* (*Sazonia*) *gorodinskii* gen. et sp. nov., holotype (genital preparation No. GA-193) (COGM): a, tegumen-uncus complex; b, valva; c, saccus; d, aedeagus. Scale bar: 0.5 mm.

Fig. 7. Male genitalia of *Sazonia* (*Miniosa*) *fenusaeformis* (Herrich-Schäffer, 1852), comb. nov. (genital preparation No. OG-95-10) (COGM): a, tegumen-uncus complex; b, valva; c, saccus; d, aedeagus. Scale bar: 0.5 mm.



Figs. 8–9. Female genitalia of *Sazonia* spp. 8, *Sazonia* (*Sazonia*) *gorodinskii* gen. et sp. nov., paratype (genital preparation No. GA-240) (COGM); 9, *Sazonia* (*Miniosa*) *fenusaeformis* (Herich-Schäffer, 1852), comb. nov. (genital preparation No. OG-95-11) (COGM). Scale bars: 0.5 mm.

Syria, Iraq.

**Etymology.** The name of this new subgenus is an anagram of *Osminia*. Gender is feminine.

***Sazonia (Miniosa) fenusaeformis*** (Herrich-Schäffer, 1852), comb. nov.  
(Figs 3, 5, 7a–d, 9)

*Sesia foenusaeformis* Herrich-Schäffer, 1846: 74 [nomen nudum].

*Sesia fenusaeformis* Herrich-Schäffer, 1852: 48. Type locality: “Aus der Türkei” [=Turkey, Bursa?]. Type-material: not mentioned.

*Sesia fenusaeformis* Lederer, 1853: 84. Type locality: Turkey, Bursa (not “Crete”!). Lectotype ♂ designated by Spatenka and Laštůvka 1988 (ZMHB).

*Sesia fenusiformis* Staudinger, 1856: 283 [unjustified emendation].

*Chamaesphecia fenusiformis* Spuler, 1910: 313 (key), 316, pl. 79, fig. 41 [unjustified emendation].

**Other synonyms.** Herrich-Schäffer 1846: 73, pl. 1, fig. 4 [as *Sesia leucopsiformis* Esper, 1800, misdetermination]. Staudinger and Rebel 1901: 405 [as *Sesia fenusaeformis* Lederer, 1852]. Bartel 1912: 413, pl. 51, row k [as *Chamaesphecia fenusaeformis* Led.]. Dalla Torre and Strand 1925: 93 [as *Chamaesphecia fenusaeformis* Lederer, 1852]. Heppner and Duckworth 1981: 36 [as *Chamaesphecia fenusaeformis* (Lederer, 1853)]. Laštůvka 1984: 382, figs 6–9 [as *Osminia fenusaeformis* (Lederer, 1853)]. Špatenka and Laštůvka 1988: 336 [as *Sesia fenusaeformis* Lederer, 1852]. Špatenka *et al.* 1993: 89; de Freina 1984: 458; Laštůvka and Laštůvka 1995: 48, fig. 10, pl. 2, fig. 9; Špatenka *et al.* 1999: 88, text-figs 46, 310, pl. 8, fig. 53 [as *Osminia fenusaeformis* (Herrich-Schäffer, 1852)].

### Acknowledgements

We would like to express our cordial thanks to Mrs Andrei A. Gorodinski and Sergei K. Sazonov (Moscow, Russia) for donating available specimens of the clearwing moths from China, and to Dr. Axel Kallies (Berlin, Germany) for valuable information concerning clearwing moth types of the ZMHB collection.

### References

- Arita, Y. and Gorbunov, O. G. 1995. A revision of the genus *Heterosphecia* Le Cerf, 1916 (Lepidoptera: Sesiidae, Osminiini). *Tinea* 14: 131–141.
- Arita Y. and Gorbunov, O. G. 1998. A revision of Ferdinand Le Cerf's clearwing moth types (Lepidoptera, Sesiidae), kept at the Paris Museum. III. The genus *Chamanthodon* Le Cerf, 1916 in the Oriental region. *Transactions of the Lepidopterological Society of Japan* 49: 19–29.
- Arita Y. and Gorbunov, O. G. 2000a. Notes on the tribe Osminiini (Lepidoptera, Sesiidae) from Vietnam, with description of new taxa. *Transactions of the Lepidopterological Society of Japan* 51: 49–74.
- Arita Y. and Gorbunov, O. G. 2000b. On the knowledge of the genus *Chamanthodon* Le Cerf,

- 1916 (Lepidoptera, Sesiidae, Osminiini) of Vietnam and adjacent countries. Transactions of the Lepidopterological Society of Japan 51: 205–214.
- Gorbunov, O. G. and Arita, Y. 1995a. A new genus and species of the clearwing moth tribe Osminiini from the Oriental Region (Lepidoptera, Sesiidae). Transactions of the Lepidopterological Society of Japan 46: 17–22.
- Gorbunov, O. G. and Arita, Y. 1995b. New and poorly known clearwing moth taxa from Vietnam (Lepidoptera, Sesiidae). Transactions of the Lepidopterological Society of Japan 46: 69–90.
- Gorbunov, O. G. and Arita, Y. 1998. A revision of Ferdinand Le Cerf's clearwing moth types (Lepidoptera, Sesiidae), kept at the Paris Museum. IV. The genera *Aenigmina* Le Cerf, 1912, *Homogyna* Le Cerf, 1911 and *Nyctaegeria* Le Cerf, 1914 in the Afrotropical Region. Tinea 15: 281–296.
- Bartel, M. 1912. Familie: Aegeriidae (Sesiidae). Pp. 375–416, pls 50–52. In: Seitz, A. (Ed.) *Die Gross-Schmetterlinge der Erde, I. Abteilung: die Gross-Schmetterlinge des paläarktischen Faunengebietes 2 (die paläarktischen Spinner und Swarmer)*. A. Kernen, Stuttgart, viii+479 pp., 56 pls.
- Duckworth, W. D. and Eichlin, T. D. 1977. A classification of the Sesiidae of America north of Mexico (Lepidoptera: Sesiidae). Occasional Papers in Entomology (26): 1–54.
- Dalla Torre, K. W. and Strand, E. 1925. Aegeriidae. In: Strand, E. (Ed.) *Lepidopterorum Catalogus 31*. W. Junk, Berlin, 202 pp.
- Eichlin, T. D. 1998. Western Hemisphere clearwing moths of the tribe Osminiini (Lepidoptera: Sesiidae: Sesiinae). Holarctic Lepidoptera 5(1): 23–33.
- Freina, J. J. de 1984. Contribution à la connaissance de la faune des Sesiidae de l'Asie Mineure (Lepidoptera: Sesiidae). Linneana Belgica 14: 455–480.
- Heppner, J. B. and Duckworth, W. D. 1981. Classification of the Superfamily Sesiioidea (Lepidoptera: Ditrysia). Smithsonian Contributions to Zoology (314): iii, 1–144.
- Herrich-Schäffer, G. A. W. 1846. XVII. Sesiides. Pp. 1–104, pls 1–8. In: Herrich-Schäffer, G. A. W. 1846–1855. *Systematische Bearbeitung der Schmetterlinge von Europa, zugleich als Text, Revision und Supplement zu Jakob Hübner's Sammlung europäischer Schmetterlinge 2*. G. J. Manz, Regensburg, 450+64 pp., 190 pls.
- Herrich-Schäffer, G. A. W. 1852. *Systematische Bearbeitung der Schmetterlinge von Europa, zugleich als Text, Revision und Supplement zu Jakob Hübner's Sammlung europäischer Schmetterlinge 6*. G. J. Manz, Regensburg, xviii+viii+178+72+48+12 pp., 35 pls.
- Laštůvka, Z. 1984. Generic and tribal positions of *Sesia palariiformis* Lederer and *S. fenusaeformis* Lederer (Lepidoptera, Sesiidae). Acta Entomologica Bohemoslovaca 81: 380–383.
- Laštůvka, Z. and Laštůvka, A. 1995. *An Illustrated Key to European Sesiidae (Lepidoptera)*. Brno, 173 pp., 8 pls.
- Lederer, J. 1853. Versuch die europäischen Lepidopteren in möglichst natürliche Reihenfolge zu Stellen. II. Abtheilung: die Heteroceren. Verhandlungen des Zoologischen-Botanischen Vereins, Wien 2: 65–126.
- Špatenka, K. and Laštůvka, Z. 1988. Typen der Glasflügler aus der Staudinger- und Püngeler Sammlung im Zoologischen Museum Berlin. Deutsche Entomologische Zeitschrift (Neue Folge) 35: 331–339.
- Špatenka, K., Gorbunov, O., Laštůvka, Z., Tošovskí, I. and Arita, Y. 1999. Sesiidae—Clearwing Moths. Pp. i–xvi, 1–569, pls 1–57. In: Naumann, C. M. (Ed.) *Handbook of Palaearctic Macrolepidoptera 1*. Gem, Wallingford, XVI+569 pp.
- Špatenka, K., Laštůvka, Z., Gorbunov, O., Tošovskí, I. and Arita, Y. 1993. Die Systematik und Synonymie der paläarktischen Glasflügler-Arten (Lepidoptera, Sesiidae). Nachrichten

des Entomologischen Vereins Apollo, Neue Folge 14: 81–114.

Spuler, A. 1910. *Die Schmetterlinge Europas* 2. E. Schweizerbart, Stuttgart, 524 pp., pls 56–91.

Staudinger, O. 1856. Beitrag zur Festsellung der bisher bekannten Sesiae-Arten Europas und des angrenzenden Asien's. Entomologische Zeitung, Stettin 17: 193–224, 257–288, 323–336.

Staudinger, O. and Rebel, H. 1901. *Catalog der Lepidopteren des palaearctischen Faunengebietes. I. Theil: Famil. Papilionidae-Hepialidae*. R. Friedländer & Sohn, Berlin, xxxii+411 pp.